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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/550,505	04/17/2000	Donald C.D. Chang	PD-990185	1446

7590 04/30/2004

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EXAMINER

FERRIS, DERRICK W

ART UNIT	PAPER NUMBER
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2663

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DATE MAILED: 04/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/550,505

Applicant(s)

CHANG ET AL.

Examiner

Derrick W. Ferris

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 April 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 7.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. **Claims 1-12** as amended are still in consideration for this application. Applicant has amended claims **1, 4, and 11**.
2. Examiner **withdraws** the drawing objection(s) for Office action filed **11/04/03**.
Examiner thanks applicant for making the necessary changes.
3. Examiner does **not withdraw** the obviousness rejection to *Dunn '498* in view of *Gilhousen*, *Dunn '498* in view of *Gilhousen* in further view of *Dunn '138*; and *Dunn '498* in view of *Gilhousen* in further view of *Witsaman* for Office action filed **11/04/03**. In addressing applicant's arguments in the response filed **01/15/04**, applicant primarily argues a *multiple* transponder platform. As such, this examiner agrees with the previous examiner's analysis of the claims given the prima facie case of obviousness. In particular, figure 1 of *Dunn '498* shows two transponders (i.e., satellites 42 and 43 since a transponder is a fancy name for radio relay equipment aboard a communications satellite using Newton's Telecom Dictionary). Thus the above limitation at issue is met. In particular, see e.g., column 6, line 60 – column 7, line 3 of *Dunn '498*. The passage cited by the pervious examiner uses only one transponder, however, figure 1 shows two transponders. Applicant argues that *Dunn '498* teaches that the two satellites do not act together since the second satellite performs a parallel function. Examiner will agree that functionality in the system is duplicated, however, it may not be clear from the reference whether the second satellite works together. However, examiner notes that *Dunn '498* teaches that the second range measurement is used in combination with first range measurement see column 6, line 67 – column 7, line 3. Thus one could argue that the two satellites act together.

However, using the references in combination the limitation at issue is further taught since *Gilhousen* further teaches the above-concept as mentioned by the previous examiner, see e.g., column 13, lines 44-67. In particular, *Gilhousen* teaches the path differences between two satellites and a user (see column 19, lines 56-57). Thus it appears that applicant only considered the references in singular and not taught in combination as the previous examiner had done.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 1, 5, 8, & 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over *Dunn*, Patent Number 3,742,498, in view of *Gilhousen*, Patent Number 4,901,307.

Regarding Claims 1, 5, 8, & 12: Figure 1 in *Dunn* shows a Master Ground Station (gateway) 40, in radio communication with satellites 42 & 43, and mobile aircraft 41 & 41N. In order to synchronize communication, the Master Ground Station transmits a "master reference sync burst" through said satellites to said aircraft (col. 5, lines 48-51). The aircraft then send a return signal through the satellites to the master station (col. 5, lines 51-58). Both timing and phase differences are then measured by the ground station and corresponding signals are adjusted to ensure proper synchronization between ground station and aircraft (col. 5, lines 59-67; col. 6, lines 1-13).

Dunn's invention utilizes TDM radio communication, rather than CDMA, as discussed in the application. *Dunn's* invention mainly concerns communication with aircraft, but does state

that the invention could be used in "any TDM multiple access system" (col. 5, lines 26-33).

Finally, *Dunn* does not specifically state that the multiple satellites used would send the signals to the aircraft such that they would arrive in the same phase with each other.

Figure 2 in *Gilhousen* discloses a CDMA communication system that is comprised of satellites 14a & 14b, in communication with mobile subscribers 20 & 22, as well as one or more central stations (gateways) 16a & 16b. The signals emanating from the central station are adjusted in both phase and time and sent to the satellites. As a result of this altering, the signals received by the mobile user occur in phase with one another and form a constructive interference pattern (col. 19, lines 44-68; col. 20, lines 1-17). In addition, Figure 8 in *Gilhousen* demonstrates how a user receives significantly more gain while located at an in-phase location than an unintended user, which would receive almost no gain, resulting from phase interference (col. 19, lines 53-67).

By combining the signal timing means described in *Dunn* with the CDMA invention of *Gilhousen*, the result would be that of the current application. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine *Dunn*'s TDM satellite system with that of *Gilhousen*'s CDMA system in order to decrease the complexity and cost, as well as create a greater number of available connections in the communication system (col. 4, lines 37-54 in *Gilhousen*).

6. **Claims 2-4 & 9-11** are rejected under 35 U.S.C. 103(a) as being unpatentable over *Dunn*, Patent Number 3,742,498, in view of *Gilhousen*, Patent Number 4,901,307, as applied to claims 1, 5, 8, & 12 above, in further view of *Dunn*, Patent Number 3,593,138. Regarding Claims 2-4 & 9-11: Figure 4 in *Dunn* (Patent Number 3,742,498) discloses transmit clock phase

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locked loop 60, as well as receive timer 45 and transmit timer 46, which are used in conjunction with the phase comparator and satellite to aircraft range indicator 52, to find the phase shift of the return sync burst signal (col. 5, lines 47-63; col. 10, lines 26-67). In addition, *Dunn* states that from the phase difference calculations, timing synchronization is also found (col. 5, lines 64-67). Thus, it is inherent in *Dunn's* invention that the time shift of the return signal is also found as a result of the phase shift measurement. While *Dunn's* invention describes how both time and phase changes are found, it does not go into great detail about how the frequency changes or Doppler shift is accounted for. Figure 1 in *Dunn* (Patent Number 3,593,138) discloses a master station 11 in communication with repeater 12 and multiple slave stations 1-10. In order to synchronize the signal between master and slave stations, Doppler shift is measured between the ground station and repeater, as well as the slave station and repeater. This is done through the use of a sync burst signal (col. 3, lines 34-42; col. 4, lines 36-67).

By combining the use of the partial Doppler correction mentioned in *Dunn* (Patent Number 3,593,138) and the use of round trip adjustment in the sync burst for both phase and time shifts mentioned in *Dunn* (Patent Number 3,742,498), the result would be that of the current application. It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine these properties in order to reduce the complexity of the circuitry associated with the mobile user (slave station) and to centralize all calculations and adjustments within the master ground station.

7. **Claims 6 & 7** are rejected under 35 U.S.C. 103(a) as being unpatentable over *Dunn*, Patent Number 3,742,498, in view of *Gilhousen*, Patent Number 4,901,307, as applied to claims 1, 5, 8, & 12 above, in further view of *Witsaman*, Patent Number 5,416,808.

Regarding Claims 6 & 7: As described above, *Dunn* and *Gilhousen* collectively describe a CDMA communication system that consists of a ranging signal sent from a master ground station, through various repeater satellites, and received by a mobile user, that, upon its return at the master station, is analyzed for shifts in both phase and time. This signal additionally takes into account the movement of the satellites relative to both the ground station and mobile user, as well as the phase, timing, and frequency changes that result, and properly synchronizes its return signals to account for said discrepancies (col. 5, lines 48-67; col. 6, lines 1-58). Additionally, from the phase/timing information calculation, the ground station sends signals to the mobile user that enable adjustment of the transmit timer within each user to synchronize with both satellites and ground station (col. 6, lines 5-13). As a result from these changes, the signals between ground station and mobile users will arrive in phase with one another.

While *Dunn* and *Gilhousen* correctly set up a synchronous signal between mobile user and ground station, they fail to make specific mention of altering the local reference clock to each mobile user as part of the synchronization process. Figures 1 & 2 in *Witsaman* disclose a simulcast network that consists of a paging system controller (23) in communication with satellite (56) and multiple paging stations (24). In addition, a maintenance operation point exists (46) that is internal to the system controller. According to *Witsaman's* invention, paging system controller informs the multiple paging stations to send out a time information command. This command, once sent by the stations and received at the system controller, is analyzed by the maintenance operation point and time calculations between when the stations received the transmit signal and when the signal arrived at the controller are made. Path delay is additionally

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taken into consideration and a time difference factor between the clock of the controller and those of the paging stations is found. This difference signal is sent to the paging stations and their internal locks are adjusted so as to coincide with that of the system controller (col. 14, lines 16-60). By combining *Dunn/Gilhousen's* CDMA communication system with the clock synchronizer described in *Witsaman*, the result would be that of the current invention. It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the system time synchronizer within a CDMA communication system so as to further coordinate the reception of signals between a gateway and mobile user. By coordinating the clocks, phase synchronization is greatly aided and overall improvement in communication quality results.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Derrick W. Ferris whose telephone number is (703) 305-4225.

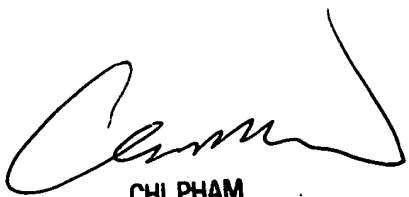
The examiner can normally be reached on M-F 9 A.M. - 4:30 P.M. E.S.T.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chau Nguyen can be reached on (703) 308-5340. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Derrick W. Ferris
Examiner
Art Unit 2663


DWF


CHI PHAM
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600 4/29/09